

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (currently amended) A method of performing PCR and separating one or more PCR products, the method comprising:

- (i) mixing one or more PCR reaction components with an unpolymerized sieving medium in a channel of a microfluidic device to provide an unpolymerized PCR sieving medium within the channel, wherein the sieving medium has a polymer concentration, and wherein said polymer concentration of the sieving medium is less than about 0.4%; and
- (ii) thermocycling the PCR sieving medium to produce one or more PCR products; and;
- (iii) polymerizing the sieving medium after thermocycling is completed, wherein the polymerized sieving medium has a polymer concentration that is less than about 0.4%; and
- (iv) separating the one or more PCR products by flowing the one or more PCR products through the polymerized sieving medium.

2. (canceled)

3. (currently amended) The method of claim 1, wherein the polymer concentration of the polymerized sieving medium is about 0.35% or less.

4. (previously presented) The method of claim 1, wherein the polymer comprises acrylamide.

5. (currently amended) The method of claim 4, wherein the acrylamide polymer comprises linear acrylamide, polyacrylamide, polydimethylacrylamide, or polydimethylacrylamide/coacrylic acid.

6. (currently amended) The method of claim 1, wherein the polymer comprises agarose, methyl cellulose, polyethylene oxide, hydroxy cellulose, or hydroxy ethyl cellulose.

7. (original) The method of claim 1, wherein the one or more PCR reaction components comprise one or more of: a thermostable DNA polymerase, a plurality of nucleotides, a nucleic acid template, a primer which hybridizes to the nucleic acid template, or Mg<sup>++</sup>.

8. (original) The method of claim 1, comprising mixing the PCR reaction components with the sieving medium in a microfluidic channel.

9. (original) The method of claim 8, further comprising separating the one or more PCR products by flowing the one or more PCR products through the sieving medium in the microfluidic channel.

10. (currently amended) The method of claim 9 1, wherein separating comprises electrophoretically separating.